

WIDE DYNAMIC RANGE POROUS PLUG AND VENT LINE FOR SIRT^{1*},
D. Petrac, U. E. Israelsson, Jet Propulsion Laboratory, CIT, CA 91 109-8099; Nakano,
A., Tsukuba University, Japan[†] - The most recent approach to the Space Infrared
Telescope Facility (SIRT¹) uses a new design concept in which the telescope is launched
warm and subsequently cooled to operating temperature on orbit. At launch the cryostat is
at 2 K and the telescope is at room temperature. Cooldown of the telescope will be
accomplished initially through radiation to space. Final cooldown to the 5.5 K operating
temperature is done with helium vapor. Initially the helium flow on orbit will be 10 to 20
times larger than required for steady-state operation. The vent line and the liquid-vapor
phase separator (porous plug) therefore must accommodate a large dynamic operational
range.

For ground testing of IR instruments, the required temperature is 1.5 K. The
helium tank temperature for both ground testing and space operations thus needs to be 1.4
K. We will present a discussion of the requirements, a conceptual design, and initial
laboratory test results with candidate porous plugs and associated instrumentation. A
discussion of possible connections to the design of Gravity Probe-B cryostat will also be
presented.

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Petrac, D.

Low Temperature Science and Engineering Group

Jet Propulsion Laboratory

Pasadena, CA 91109-8099

Voice 818-354-3026

FAX 818-393-4878

Petrac, D.; Israelsson, U. E.; Nakano, A.

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